

1 **WHAT IS CLAIMED IS:**

1 1. A head stack assembly for a disk drive having a disk, the head stack assembly  
2 comprising:

3 a body portion;

4 an actuator arm cantilevered from the body portion;

5 a hinge, a first surface of the hinge being coupled to the actuator arm;

6 a load beam having a first end and a second end, the first end being attached to a second  
7 surface of the hinge, the second surface facing away from the first surface;

8 a gimbal coupled to the second end of the load beam, and

9 a slider coupled to the gimbal.

10 2. The head stack assembly of Claim 1, further including a mount plate attached to  
11 the actuator arm, the hinge being coupled to the actuator arm via the mount plate, the mount plate  
12 having a thickness that is greater than 0.22 mm.

13 3. The head stack assembly of Claim 1, wherein the hinge has a thickness that is  
14 greater than 0.05 mm.

15 4. The head stack assembly of Claim 1, wherein the load beam has a thickness that is  
16 greater than 0.12 mm.

17 5. The head stack assembly of Claim 1, wherein the hinge includes a radius  
18 geometry that defines a first radius of curvature, a second radius of curvature and a third radius  
19 of curvature, the first radius being closer to the mount plate than the second radius, the second  
20 radius being closer to the mount plate than the third radius, and wherein the third radius is greater  
21 than the second radius.

22 6. A disk drive, comprising:

23 a disk having a recording surface;

24 a head stack assembly, including:

a body portion;

an actuator arm cantilevered from the body portion;

a hinge, a first surface of the hinge being coupled to the actuator arm;

a load beam having a first end and a second end, the first end being attached to a second surface of the hinge, the second surface facing away from the first surface;

a gimbal coupled to the second end of the load beam, and

a slider coupled to the gimbal.

7. The disk drive of Claim 6, further including a mount plate attached to the actuator arm, the hinge being coupled to the actuator arm via the mount plate, the mount plate having a thickness that is greater than 0.22 mm.

8. The disk drive of Claim 6, wherein the hinge has a thickness that is greater than 0.05 mm.

9. The disk drive of Claim 6, wherein the load beam has a thickness that is greater than 0.12 mm.

10. The disk drive of Claim 6, wherein the hinge includes a radius geometry that defines a first radius of curvature, a second radius of curvature and a third radius of curvature, the first radius being closer to the mount plate than the second radius, the second radius being closer to the mount plate than the third radius, and wherein the third radius is greater than the second radius.

11. A head gimbal assembly for a head stack assembly of a disk drive, the head stack assembly including a body portion, an actuator arm cantilevered from the body portion, the disk drive having a disk, comprising:

a hinge, a first surface of the hinge being coupled to the actuator arm;

a load beam having a first end and a second end, the first end being attached to a second surface of the hinge, the second surface facing away from the first surface;

a gimbal coupled to the second end of the load beam, and

8 a slider coupled to the gimbal.

1 12. The head gimbal assembly of Claim 11, wherein the hinge has a thickness that is  
2 greater than 0.05 mm.

3 13. The head gimbal assembly of Claim 11, wherein the load beam has a thickness  
4 that is greater than 0.12 mm.

1 14. The head gimbal assembly of Claim 11, wherein the hinge includes a radius  
2 geometry that defines a first radius of curvature, a second radius of curvature and a third radius  
3 of curvature, the first radius being closer to the mount plate than the second radius, the second  
4 radius being closer to the mount plate than the third radius, and wherein the third radius is greater  
5 than the second radius.

1 15. A suspension for a head stack assembly of a disk drive, the head stack assembly  
2 including an actuator arm and a mount plate, the suspension comprising:

3 a hinge, a first surface of the hinge for coupling to the actuator arm;

4 a load beam having a first end and a second end, the first end being attached to a second  
5 surface of the hinge, the second surface facing away from the first surface, and

6 a gimbal coupled to the second end of the load beam.

1 16. The suspension of Claim 15, wherein the hinge has a thickness that is greater than  
2 0.05 mm.

1 17. The suspension of Claim 15, wherein the load beam has a thickness that is greater  
2 than 0.12 mm.

1 18. The suspension of Claim 15, wherein the hinge includes a radius geometry that  
2 defines a first radius of curvature, a second radius of curvature and a third radius of curvature, the  
3 first radius being closer to the mount plate than the second radius, the second radius being closer  
4 to the mount plate than the third radius, and wherein the third radius is greater than the second  
5 radius.

1 19. A suspension for a head stack assembly of a disk drive, the head stack assembly  
2 including an actuator arm and a mount plate, the disk drive having a disk, the suspension

3 comprising:

4 a load beam having a first end and a second end, the first end defining an integral hinge  
5 portion, the hinge portion defining a radius geometry that includes at least two radii of curvatures  
6 configured to lower load beam toward the disk, a first surface of the hinge portion for coupling to  
7 the actuator arm, and

8 a gimbal coupled to the second end of the load beam.

1 20. The suspension of Claim 19, wherein the hinge portion has a thickness that is  
2 greater than 0.05 mm.

1 21. The suspension of Claim 19, wherein the load beam has a thickness that is greater  
2 than 0.12 mm.

1 22. The suspension of Claim 19, wherein the radius geometry includes a first radius  
2 of curvature, a second radius of curvature and a third radius of curvature, the first radius being  
3 closer to the mount plate than the second radius, the second radius being closer to the mount  
4 plate than the third radius, and wherein the third radius is greater than the second radius.

1 23. A head gimbal assembly for a head stack assembly of a disk drive, the head stack  
2 assembly including a body portion, an actuator arm cantilevered from the body portion, the disk  
3 drive having a disk, the head gimbal assembly comprising:

4 a load beam having a first end and a second end, the first end defining an integral hinge  
5 portion, the hinge portion defining a radius geometry that includes at least two radii of curvatures  
6 configured to lower load beam toward the disk, a first surface of the hinge portion being coupled  
7 to the actuator arm;

8 a gimbal coupled to the second end of the load beam, and

9 a slider coupled to the gimbal.

1 24. The head gimbal assembly of Claim 23, wherein the hinge has a thickness that is  
2 greater than 0.05 mm.

1 25. The head gimbal assembly of Claim 23, wherein the load beam has a thickness  
2 that is greater than 0.12 mm.

1           26.    The head gimbal assembly of Claim 23, wherein the radius geometry includes a  
2   first radius of curvature, a second radius of curvature and a third radius of curvature, the first  
3   radius being closer to the mount plate than the second radius, the second radius being closer to  
4   the mount plate than the third radius, and wherein the third radius is greater than the second  
5   radius.

1           27.    A head stack assembly for a disk drive having a disk, the head stack assembly  
2   comprising:

3           a body portion;

4           an actuator arm cantilevered from the body portion;

5           a load beam having a first end and a second end, the first end defining an integral hinge  
6   portion, the hinge portion defining a radius geometry that includes at least two radii of curvatures  
7   configured to lower load beam toward the disk, a first surface of the hinge portion being coupled  
8   to the actuator arm;

9           a gimbal coupled to the second end of the load beam, and

10          a slider coupled to the gimbal.

1           28.    The head stack assembly of Claim 26, further including a mount plate attached to  
2   the actuator arm, the hinge being coupled to the actuator arm via the mount plate, the mount plate  
3   having a thickness that is greater than 0.22 mm.

4           29.    The head stack assembly of Claim 27, wherein the hinge has a thickness that is  
5   greater than 0.05 mm.

1           30.    The head stack assembly of Claim 27, wherein the load beam has a thickness that  
2   is greater than 0.12 mm.

1           31.    The head stack assembly of Claim 27, wherein the radius geometry includes a first  
2   radius of curvature, a second radius of curvature and a third radius of curvature, the first radius  
3   being closer to the mount plate than the second radius, the second radius being closer to the  
4   mount plate than the third radius, and wherein the third radius is greater than the second radius.

1           32.    A disk drive, comprising:

a disk having a recording surface;

a head stack assembly, including:

a body portion;

an actuator arm cantilevered from the body portion;

a load beam having a first end and a second end, the first end defining an integral hinge portion, the hinge portion defining a radius geometry that includes at least two radii of curvatures configured to lower load beam toward the disk, a first surface of the hinge portion being coupled to the actuator arm;

a gimbal coupled to the second end of the load beam, and

a slider coupled to the gimbal.

33. The disk drive of Claim 32, further including a mount plate attached to the actuator arm, the hinge being coupled to the actuator arm via the mount plate, the mount plate having a thickness that is greater than 0.22 mm.

34. The disk drive of Claim 32, wherein the hinge has a thickness that is greater than 0.05 mm.

35. The disk drive of Claim 32, wherein the load beam has a thickness that is greater than 0.12 mm.

36. The disk drive of Claim 32, wherein the radius geometry includes a first radius of curvature, a second radius of curvature and a third radius of curvature, the first radius being closer to the mount plate than the second radius, the second radius being closer to the mount plate than the third radius, and wherein the third radius is greater than the second radius.

37. A head stack assembly for a disk drive having a disk, the head stack assembly comprising:

a body portion;

an actuator arm cantilevered from the body portion;

a hinge defining a radius geometry, the radius geometry including at least two radii of

6 curvatures, the hinge being coupled to the actuator arm;

7 a load beam having a first end and a second end, the first end being coupled to the hinge;

8 a gimbal coupled to the second end of the load beam, and

9 a slider coupled to the gimbal.

1 38. The head stack assembly of Claim 37, further including a mount plate attached to  
2 the actuator arm, the hinge being coupled to the actuator arm via the mount plate, the mount plate  
3 having a thickness that is greater than 0.22 mm.

1 39. The head stack assembly of Claim 37, wherein the hinge has a thickness that is  
2 greater than 0.05 mm.

1 40. The head stack assembly of Claim 37, wherein the load beam has a thickness that  
2 is greater than 0.12 mm.

1 41. The head stack assembly of Claim 37, wherein the radius geometry includes a first  
2 radius of curvature, a second radius of curvature and a third radius of curvature, the first radius  
3 being closer to the mount plate than the second radius, the second radius being closer to the  
4 mount plate than the third radius, and wherein the third radius is greater than the second radius.

1 42. A disk drive, comprising:

2 a disk having a recording surface;

3 a head stack assembly, including:

4 a body portion;

5 an actuator arm cantilevered from the body portion;

6 a hinge defining a radius geometry, the radius geometry including at least two  
7 radii of curvatures, the hinge being coupled to the actuator arm;

8 a load beam having a first end and a second end, the first end being coupled to the  
9 hinge;

10 a gimbal coupled to the second end of the load beam, and

11 a slider coupled to the gimbal.

1 43. The disk drive of Claim 42, further including a mount plate attached to the  
2 actuator arm, the hinge being coupled to the actuator arm via the mount plate, the mount plate  
3 having a thickness that is greater than 0.22 mm.

1 44. The disk drive of Claim 42, wherein the hinge has a thickness that is greater than  
2 0.05 mm.

1 45. The disk drive of Claim 42, wherein the load beam has a thickness that is greater  
2 than 0.12 mm.

1 46. The disk drive of Claim 42, wherein the radius geometry includes a first radius of  
2 curvature, a second radius of curvature and a third radius of curvature, the first radius being  
3 closer to the mount plate than the second radius, the second radius being closer to the mount  
4 plate than the third radius, and wherein the third radius is greater than the second radius.

1 47. A head gimbal assembly for a head stack assembly of a disk drive, the head stack  
2 assembly including a body portion, an actuator arm cantilevered from the body portion, the disk  
3 drive having a disk, the head gimbal assembly comprising:

4 a hinge defining a radius geometry, the radius geometry including at least two radii of  
5 curvatures, the hinge being coupled to the actuator arm;

6 a load beam having a first end and a second end, the first end being coupled to the hinge;

7 a gimbal coupled to the second end of the load beam, and

8 a slider coupled to the gimbal.

1 48. The head gimbal assembly of Claim 47, wherein the hinge has a thickness that is  
2 greater than 0.05 mm.

1 49. The head gimbal assembly of Claim 47, wherein the load beam has a thickness  
2 that is greater than 0.12 mm.

1 50. The head gimbal assembly of Claim 47, wherein the radius geometry includes a  
2 first radius of curvature, a second radius of curvature and a third radius of curvature, the first  
3 radius being closer to the mount plate than the second radius, the second radius being closer to



the mount plate than the third radius, and wherein the third radius is greater than the second radius.

51. A suspension for a head stack assembly of a disk drive, the head stack assembly including an actuator arm and a mount plate, the disk drive having a disk, the suspension comprising:

a hinge defining a radius geometry, the radius geometry including at least two radii of curvatures, the hinge for coupling to the actuator arm;

a load beam having a first end and a second end, the first end being coupled to the hinge, and

a gimbal coupled to the second end of the load beam.

52. The suspension of Claim 51, wherein the hinge has a thickness that is greater than 0.05 mm.

53. The suspension of Claim 51, wherein the load beam has a thickness that is greater than 0.12 mm.

54. The suspension of Claim 51, wherein the radius geometry includes a first radius of curvature, a second radius of curvature and a third radius of curvature, the first radius being closer to the mount plate than the second radius, the second radius being closer to the mount plate than the third radius, and wherein the third radius is greater than the second radius.